

# User Manual

## SOM-4430

*Trusted ePlatform Services*

**ADVANTECH**

---

## Copyright

The documentation and the software included with this product are copyrighted 2008 by Advantech Co., Ltd. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements in the products described in this manual at any time without notice. No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. Information provided in this manual is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, nor for any infringements of the rights of third parties, which may result from its use.

## Acknowledgements

Intel and Pentium are trademarks of Intel Corporation.

Microsoft Windows and MS-DOS are registered trademarks of Microsoft Corp.

All other product names or trademarks are properties of their respective owners.

## FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Technical Support and Assistance

1. Visit the Advantech web site at [www.advantech.com/support](http://www.advantech.com/support) where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
  - Product name and serial number
  - Description of your peripheral attachments
  - Description of your software (operating system, version, application software, etc.)
  - A complete description of the problem
  - The exact wording of any error messages

## Warnings, Cautions and Notes

**Warning!** *Warnings indicate conditions, which if not observed, can cause personal injury!*



**Caution!** *Cautions are included to help you avoid damaging hardware or losing data.*



**Note!** *Notes provide optional additional information.*



## Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to:  
[support@advantech.com](mailto:support@advantech.com)

---

## Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment does not work well, or you cannot get it to work according to the user's manual.
  - The equipment has been dropped and damaged.
  - The equipment has obvious signs of breakage.
15. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.**
16. **CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**
17. The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

**DISCLAIMER:** This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

## Wichtige Sicherheitshinweise

1. Bitte lesen Sie sich diese Hinweise sorgfältig durch.
2. Heben Sie diese Anleitung für den späteren Gebrauch auf.
3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie keine Flüssig- oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.
4. Die Netzanschlusssteckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.
5. Das Gerät ist vor Feuchtigkeit zu schützen.
6. Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen.
7. Die Belüftungsöffnungen dienen zur Luftzirkulation, die das Gerät vor Überhitzung schützt. Sorgen Sie dafür, dass diese Öffnungen nicht abgedeckt werden.
8. Beachten Sie beim Anschluss an das Stromnetz die Anschlusswerte.
9. Verlegen Sie die Netzanschlussleitung so, dass niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.
10. Alle Hinweise und Warnungen, die sich an den Geräten befinden, sind zu beachten.
11. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.
12. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. elektrischen Schlag auslösen.
13. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von autorisiertem Servicepersonal geöffnet werden.
14. Wenn folgende Situationen auftreten, ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:
  15. Netzkabel oder Netzstecker sind beschädigt.
  16. Flüssigkeit ist in das Gerät eingedrungen.
  17. Das Gerät war Feuchtigkeit ausgesetzt.
18. Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
19. Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
20. Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.
21. **VORSICHT:** Explosionsgefahr bei unsachgemäßen Austausch der Batterie. Ersatz nur durch denselben oder einem vom Hersteller empfohlenen ähnlichen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.
22. **ACHTUNG:** Es besteht die Explosionsgefahr, falls die Batterie auf nicht fachmännische Weise gewechselt wird. Verfassen Sie die Batterie nur gleicher oder entsprechender Type, wie vom Hersteller empfohlen. Entsorgen Sie Batterien nach Anweisung des Herstellers.
23. Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weniger.

Haftungsausschluss: Die Bedienungsanleitungen wurden entsprechend der IEC-704-1 erstellt. Advantech lehnt jegliche Verantwortung für die Richtigkeit der in diesem Zusammenhang getätigten Aussagen ab.

---

## Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

# Contents

<b>Chapter</b>	<b>1</b>	<b>General Information .....</b>	<b>1</b>
1.1		Introduction .....	2
1.2		Specifications .....	2
1.2.1		Standard System On Module Functions .....	2
1.2.2		VGA/Flat Panel Interface .....	2
1.2.3		Audio Function .....	2
1.2.4		Mechanical and Environmental .....	2
1.2.5		Connector Table .....	3
<b>Chapter</b>	<b>2</b>	<b>Mechanical Information .....</b>	<b>5</b>
2.1		Board Connector .....	6
		Figure 2.1 SOM-4430 locating connectors .....	6
2.2		Board Mechanical Drawing .....	7
2.2.1		Front Side .....	7
		Figure 2.2 SOM-4430 front side drawing .....	7
2.2.2		Rear Side .....	7
		Figure 2.3 SOM-4430 rear side drawing .....	7
<b>Chapter</b>	<b>3</b>	<b>BIOS Setup Information .....</b>	<b>9</b>
3.1		BIOS Introduction .....	10
3.2		BIOS Setup .....	10
		Table 3.1: Control Keys .....	10
3.2.1		Main Menu .....	11
3.2.2		Standard CMOS Features .....	12
3.2.3		Advanced BIOS Features .....	13
3.2.4		Advanced Chipset Features .....	14
3.2.5		Integrated Peripherals .....	15
3.2.6		Load Optimized Defaults .....	16
3.2.7		Set Password .....	16
3.2.8		Save & Exit Setup .....	18
3.2.9		Quit Without Saving .....	18
<b>Appendix A</b>		<b>System Assignments .....</b>	<b>19</b>
A.1		Watchdog Timer Programming .....	20
		Table A.1: Watchdog Control: Watchdog Timer Control Register - Index 68h .....	20
		Table A.2: Watchdog Control: Watchdog Timer Control Register - Index 69h .....	20
		Table A.3: Watchdog Control: Watchdog Timer Control Register - Index 6Ah .....	20
		Table A.4: Watchdog reset timing control: Watchdog Timer Control Register - Index 6Bh .....	20
<b>Appendix B</b>		<b>Programming GPIO .....</b>	<b>21</b>
B.1		GPIO Register .....	22
		Table B.1: BASE_ADDR defined on SB PCI CFG 61-60h .....	22
		Table B.2: BASE_ADDR defined on SB PCI CFG 63-62h .....	22

Table B.3: BASE_ADDR defined on SB PCI CFG 65-64h .....	22
Table B.4: BASE_ADDR defined on SB PCI CFG 67-66h .....	22
Table B.5: BASE_ADDR defined on SB PCI CFG 69-68h .....	22
Table B.6: BASE_ADDR defined on SB PCI CFG 6B-6Ah .....	22

Appendix C

System Assignments.....
23

C.1	System I/O Ports.....	24
	Table C.1: System I/O Ports .....	24
C.2	DMA Channel Assignments .....	24
	Table C.2: DMA Channel Assignments .....	24
C.3	Interrupt Assignments .....	25
	Table C.3: Interrupt Assignments .....	25
C.4	1st MB Memory Map .....	25
	Table C.4: 1st MB Memory Map .....	25



# Chapter 1

## General Information

This chapter gives background information on the SOM-4430 CPU System on Module.

Sections include:

- Introduction
- Specification

---

## 1.1 Introduction

SOM-4430 is an embedded CPU module that fully complies with the SOM-ETX form factor standard. The new CPU module supports Advantech EVA-X4300 SOC (system on chip) which supports PCI and ISA interfaces. In a basic form factor of 95 mm x 114 mm, the SOM-4430 provides a scalable cost effective and easy to integrate solution for customers' applications by utilizing a plug-in CPU module on an application-specific customer solution board. The SOM-4430 with advanced I/O capacity incorporates PCI, ISA, IDE, USB 2.0, and TTL LCD interfaces. SOM-4430 offers design partners more choices for their own applications needing cost effective solution while maintaining a compact form factor.

The small size (95 mm x 114 mm) and use of four high capacity connectors based on the proven SOM-ETX form factor, allows SOM-ETX modules to be easily and securely mounted onto a customized solution board or our standard SOM-DB4400 development board.

## 1.2 Specifications

### 1.2.1 Standard System On Module Functions

- **CPU:** Advantech SOC EVA-X4300 300 MHz
- **BIOS:** Advantech SOC EVA-X4300 300 MHz integrated BIOS
- **Chipset:** Advantech SOC EVA-X4300
- **System memory:** Onboard 64/128 MB DDR2 Memory
- **Enhanced IDE interface:** 1 EIDE channel for two devices. BIOS auto-detects up to UDMA -100
- **Watchdog timer:** 24 bits timer interval, from 30.5 u to 255 sec setup by software, jumper less selection, generates system reset
- **USB interface:** Supports 4 USB 2.0 ports
- **Expansion interface:** Supports PCI, ISA interface

### 1.2.2 VGA/Flat Panel Interface

- **Chipset:** SMI 712 graphic controller
- **Memory size:** 4 MB
- **Display mode:**
  - CRT Mode: Supports up to 1024 x 768
  - LCD Mode: Supports up to 1024 x 768

### 1.2.3 Audio Function

- **Audio interface:** N/A

### 1.2.4 Mechanical and Environmental

- **Dimensions:** SOM ETX form-factor, 114 mm x 95 mm (4.5" x 3.74")
- **Power supply voltage:** +5 V power only (+5 VSB is need for ACPI and ATX power)
- **Power requirement:** Max: +5 V @ 0.7 A (64 MB DDR2 onboard)
- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F)
- **Operating humidity:** 0% ~ 90% relative humidity, non-condensing
- **Weight:** 0.103 Kg (weight of total package)

### 1.2.5 Connector Table

CN1 JTAG			
1	+5V	2	GND
3	TCLK	4	TDO
5	TDI	6	TMS
CN3 GPIO			
1	GND	2	+5V
3	SB_GP0_0	4	SB_GP1_0
5	SB_GP0_1	6	SB_GP1_1
7	SB_GP0_2	8	SB_GP1_2
9	SB_GP0_3	10	SB_GP1_3
11	SB_GP0_4	12	SB_GP1_4
13	SB_GP0_5	14	SB_GP1_5
15	SB_GP0_6	16	SB_GP1_6
17	SB_GP0_7	18	SB_GP1_7
19	+5V	20	GND



# Chapter 2

## Mechanical Information

This chapter gives mechanical and connector information on the SOM-4430 CPU System on Module.

Sections include:

- Connector Information
- Mechanical Drawing

## 2.1 Board Connector

There are two connectors at the rear side of SOM-4430 for connecting to the carrier board.

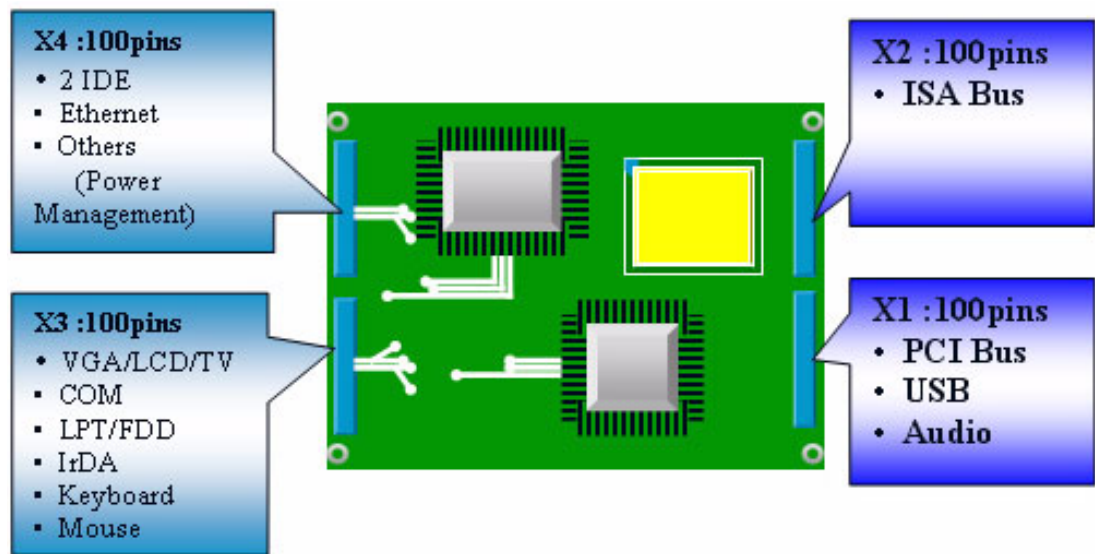


Figure 2.1 SOM-4430 locating connectors

### Pin Assignments for X1/2/3/4 connectors

Please refer to SOM-ETX Design and Specification Guide.

## 2.2 Board Mechanical Drawing

### 2.2.1 Front Side

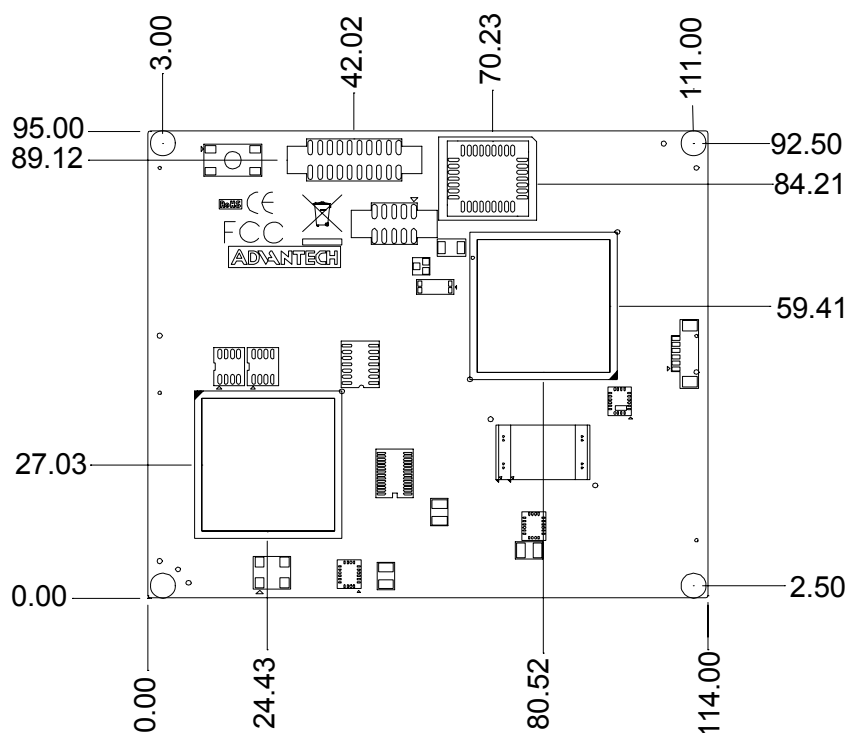


Figure 2.2 SOM-4430 front side drawing

### 2.2.2 Rear Side

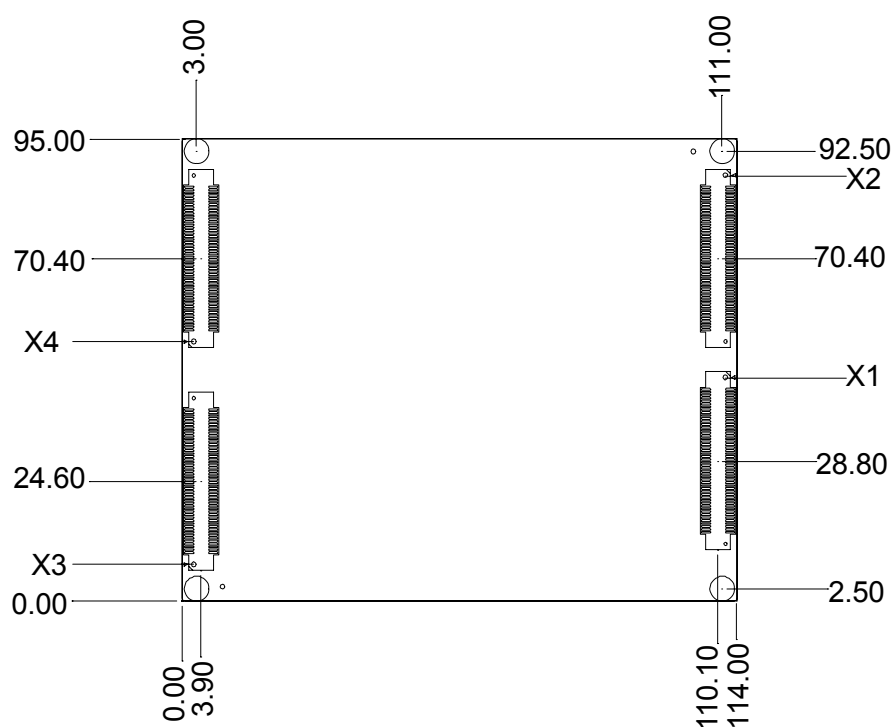


Figure 2.3 SOM-4430 rear side drawing





# Chapter 3

## BIOS Setup Information

This chapter gives basic BIOS introduction and setup information on the SOM-4430 CPU System on Module.

Sections include:

- BIOS Introduction
- BIOS Setup

## 3.1 BIOS Introduction

The full-featured AwardBIOS 6.0 is provided by Advantech which delivers superior performance, and it's many options and extensions let you customize your products to a wide range of designs and target markets.

The modular, adaptable AwardBIOS 6.0 supports the broadest range of third-party peripherals and all popular chipsets, plus Intel, AMD, nVidia, VIA, and compatible CPUs from 386 through Pentium and AMD Geode, K7 and K8 (including multiple processor platforms), and VIA Eden C3 and C7 CPU.

You can use Advantech's utilities to select and install features to suit your designs for your customers needs.

## 3.2 BIOS Setup

The SOM-4430 system has a built-in AwardBIOS with a CMOS SETUP utility which allows the user to configure required settings or activate certain system features.

The CMOS SETUP saves the configuration in the CMOS RAM of the motherboard. When the power is turned off, the battery on the board supplies the necessary power to the CMOS RAM.

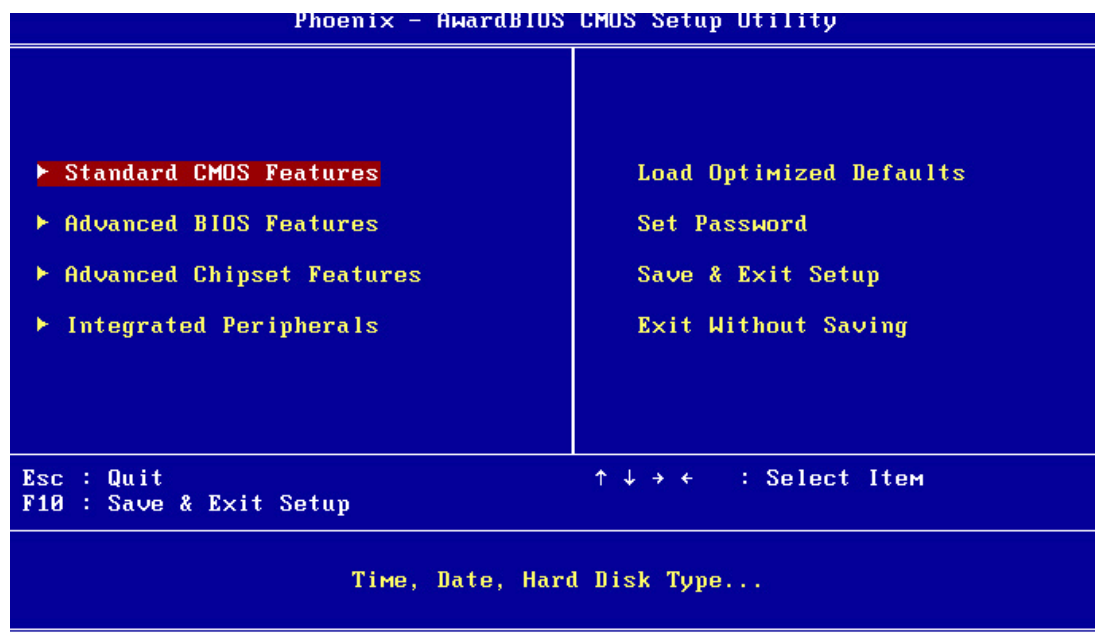
When the power is turned on, press the <Del> button during the BIOS POST (Power-On Self Test) which will take you to the CMOS SETUP screen.

**Table 3.1: Control Keys**

< ↑ >< ↓ >< ← >< → >	Move to select item
<Enter>	Select Item
<Esc>	Main Menu - Quit and not save changes into CMOS Sub Menu - Exit current page and return to Main Menu
<Page Up/+>	Increase the numeric value or make changes
<Page Down/->	Decrease the numeric value or make changes
<F1>	General help, for Setup Sub Menu
<F2>	Item Help
<F5>	Load Previous Values
<F7>	Load Optimized Default
<F10>	Save all CMOS changes

### 3.2.1 Main Menu

Press <Del> to enter AwardBIOS's CMOS Setup Utility, the Main Menu will appear on the screen. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.



#### Standard CMOS Features

This setup page includes all the items in standard compatible BIOS.

#### Advanced BIOS Features

This setup page includes all the items of Award BIOS's enhanced features.

#### Advanced Chipset Features

This setup page includes all the items of Chipset configuration features.

#### Integrated Peripherals

This setup page includes all onboard peripheral devices.

#### Load Optimized Defaults

This setup page includes the Load system optimized value, so the system operates at the best performance configuration.

#### Set Password

Establish, change or disable password.

#### Save & Exit Setup

Save CMOS value settings to CMOS and exit BIOS setup.

#### Exit Without Saving

Abandon all CMOS value changes and exit BIOS setup.

### 3.2.2 Standard CMOS Features

Phoenix - AwardBIOS CMOS Setup Utility Standard CMOS Features		
Date (MM:dd:yy)	Thu, Jun 5 2008	Item Help
Time (hh:mm:ss)	11 : 17 : 13	
▶ IDE Channel 0 Master		Menu Level ▶
▶ IDE Channel 0 Slave		Change the day, month, year and century
Base Memory	1K	
Extended Memory	1K	
Total Memory	512K	
↑↓→←:Move   Enter:Select   +/-/PU/PD:Value   F10:Save   ESC:Exit   F1:General Help F5:Previous Values   F7: Optimized Defaults		

#### Date

The date format is <week>, <month>, <day>, <year>.

Week            From Sun to Sat, determined and display by BIOS only

Month           From Jan to Dec

Day             From 1 to 31

Year            From 1999 through 2098

#### Time

The time format is <hour> <minute> <second> format, based on 24-hour time.

#### IDE Channel 0 Master/Slave

IDE HDD Auto-Detection Press "Enter" for automatic device detection.

#### IDE Channel 1 Master/Slave

IDE HDD Auto-Detection Press "Enter" for automatic device detection.

#### Base Memory

The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system.

#### Extended Memory

The POST of the BIOS will determine the amount of extended memory (above 1MB in CPU's memory address map) installed in the system.

#### Total Memory

This item displays the total system memory size.

### 3.2.3 Advanced BIOS Features

Phoenix - AwardBIOS CMOS Setup Utility		
Advanced BIOS Features		
▶ Hard Disk Boot Priority	[Press Enter]	Item Help
First Boot Device	[Hard Disk]	Menu Level ▶
Second Boot Device	[LS120]	
Boot Other Device	[Enabled]	
Fast Boot	[Disabled]	
Blank Boot	[Disabled]	
Summary Screen Show	[Disabled]	Select Hard Disk Boot Device Priority

↑↓←→:Move    Enter:Select    +/~/PU/PD:Value    F10:Save    ESC:Exit    F1:General Help  
 F5:Previous Values    F7: Optimized Defaults

## Hard Disk Boot Priority

This item allows the user to select the boot sequence for system devices: HDD, SCSI, RAID.

**First / Second / Third / Other Boot Drive**

LS120	Select boot device priority by LS120.
Hard Disk	Select boot device priority by Hard Disk.
CDROM	Select boot device priority by CDROM.
ZIP	Select boot device priority by ZIP.
USB-FDD	Select boot device priority by USB-FDD.
USB-ZIP	Select boot device priority by USB-ZIP.
USB-CDROM	Select boot device priority by USB-CDROM.
LAN	Select boot device priority by LAN.
Disabled	Disable this boot function.

**Fast Boot** [Disabled]

This item enable/disable Fast Boot feature.

## Blank Boot [Disabled]


This item enable/disable Blank Boot feature.

**Summary Screen Show** [Disabled]

This item whether summary screen shows or not.

### 3.2.4 Advanced Chipset Features

Phoenix - AwardBIOS CMOS Setup Utility		
Advanced Chipset Features		
▶ SMI712 VGA Setting	[Press Enter]	Item Help
EVA-X4300 IDE Legacy mode	[Enabled]	Menu Level ▶
Watch Dog Timer reset	[Disabled]	
EVA-X4300 PXE ROM	[Disable network boot]	
Do CMOS Clear	[Disabled]	
▶ EVA-X4300 IO Config	[Press Enter]	
▶ USB Device Setting	[Press Enter]	
↑↓→←:Move    Enter:Select    +/-/PU/PD:Value    F10:Save    ESC:Exit    F1:General Help		
F5:Previous Values    F7: Optimized Defaults		

**Note!**  This “Advanced Chipset Features” option controls the configuration of the board’s chipset, this page varies depending on the chipset, for controlling chipset register settings and fine tuning system performance. It is strongly recommended only technical users make changes to the default settings.

**SMI712 VGA Setting** [Press Enter]

This item allows users to set VGA related features.

**EVA-X4300 IDE Legacy mode** [Enabled]

This item enables EVA-X4300 IDE as legacy IDE controller or PCI IDE controller.

**Watch Dog Timer reset** [Disabled]

This item allows users to set the watch dog timer.

**EVA-X4300 PXE ROM** [Disable network boot]

This item allows users to choose the way that EVA-X4300 LAN boot rom works.

**Do CMOS Clear** [Disabled]

This item allows users to clear CMOS.

**EVA-X4300 IO Config** [Press Enter]

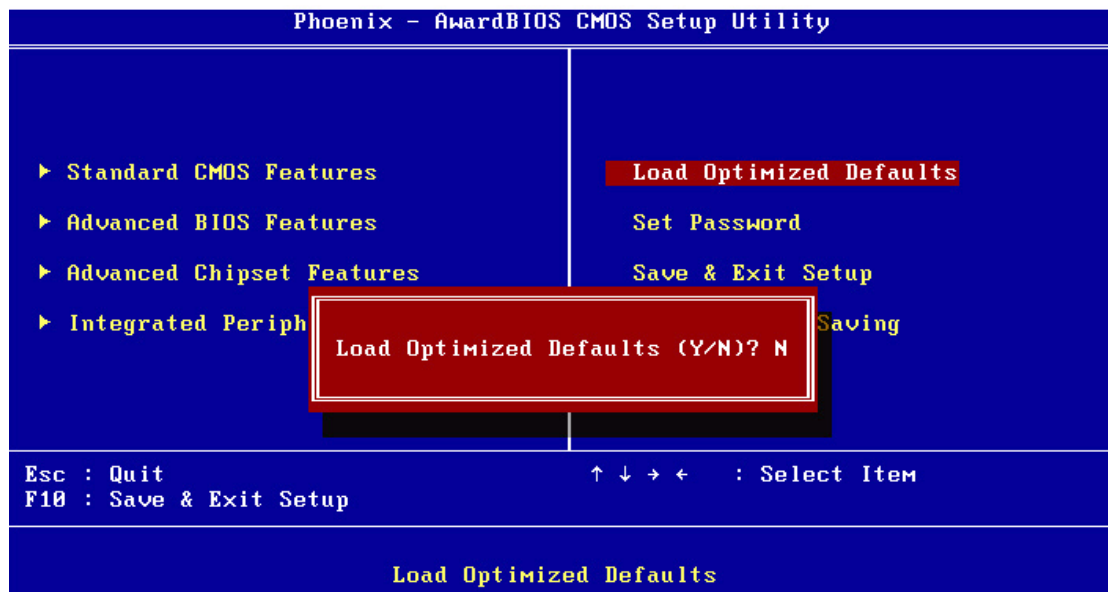
This item allows users to set EVA-X4300 UART, LPT resources.


**USB Devices Setting** [Press Enter]

This item allows users to set USB related features.

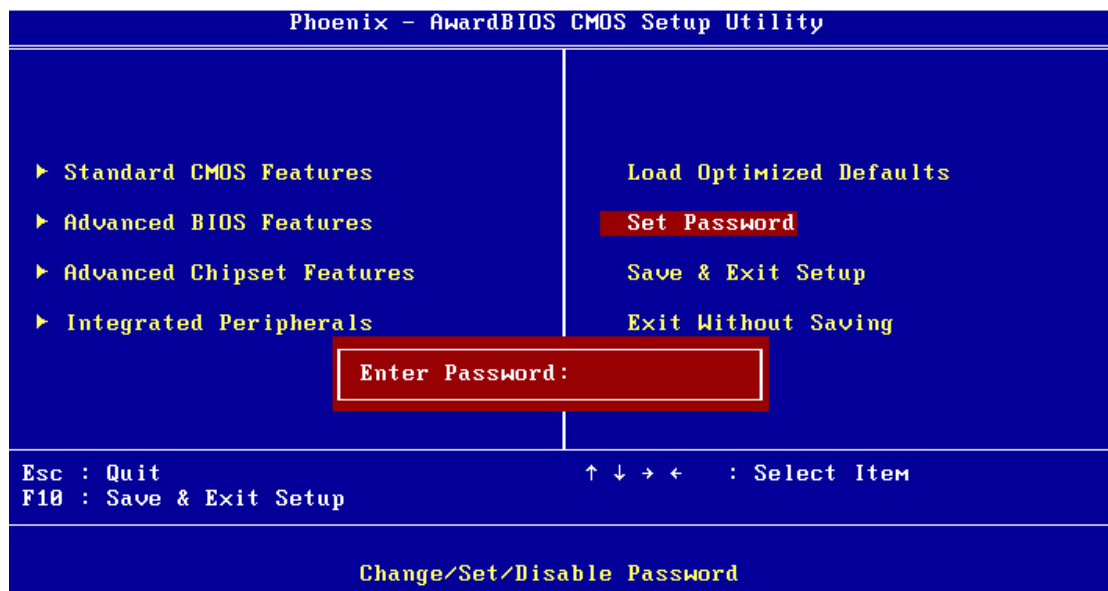


### 3.2.6 Load Optimized Defaults




**Note!**  Load Optimized Defaults loads the default system values directly from ROM. If the stored record created by the Setup program should ever become corrupted (and therefore unusable), these defaults will load automatically when you turn the SOM-4430 Series system on.

### 3.2.7 Set Password





**Note!**  To enable this feature, you should first go to the Advanced BIOS Features menu, choose the Security Option, and select either Setup or System, depending on which aspect you want password protected. Setup requires a password only to enter Setup. System requires the password either to enter Setup or to boot the system. A password may be at most 8 characters long.

#### **To Establish Password**

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.
2. When you see "Enter Password", enter the desired password and press <Enter>.
3. At the "Confirm Password" prompt, retype the desired password, then press <Enter>.
4. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

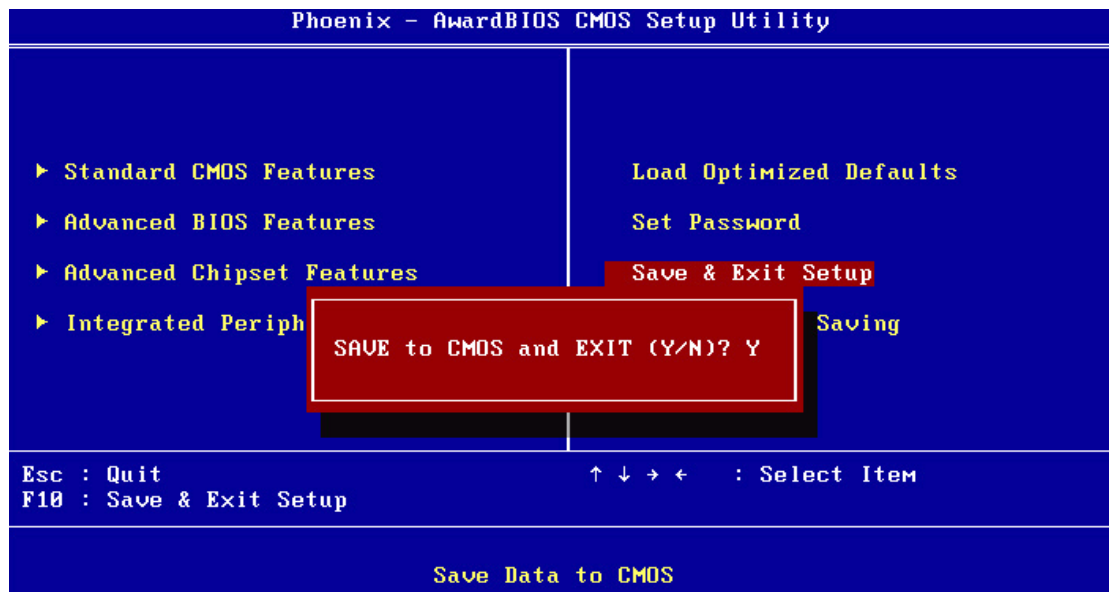
#### **To Change Password**

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.
2. When you see "Enter Password", enter the existing password and press <Enter>.
3. You will see "Confirm Password". Type it again, and press <Enter>.
4. Select Set Password again, and at the "Enter Password" prompt, enter the new password and press <Enter>.
5. At the "Confirm Password" prompt, retype the new password, and press <Enter>.
6. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

#### **To Disable Password**

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.
2. When you see "Enter Password", enter the existing password and press <Enter>.
3. You will see "Confirm Password". Type it again, and press <Enter>.
4. Select Set Password again, and at the "Enter Password" prompt, please don't enter anything; just press <Enter>.
5. At the "Confirm Password" prompt, again, don't type in anything; just press <Enter>.
6. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

### 3.2.8 Save & Exit Setup

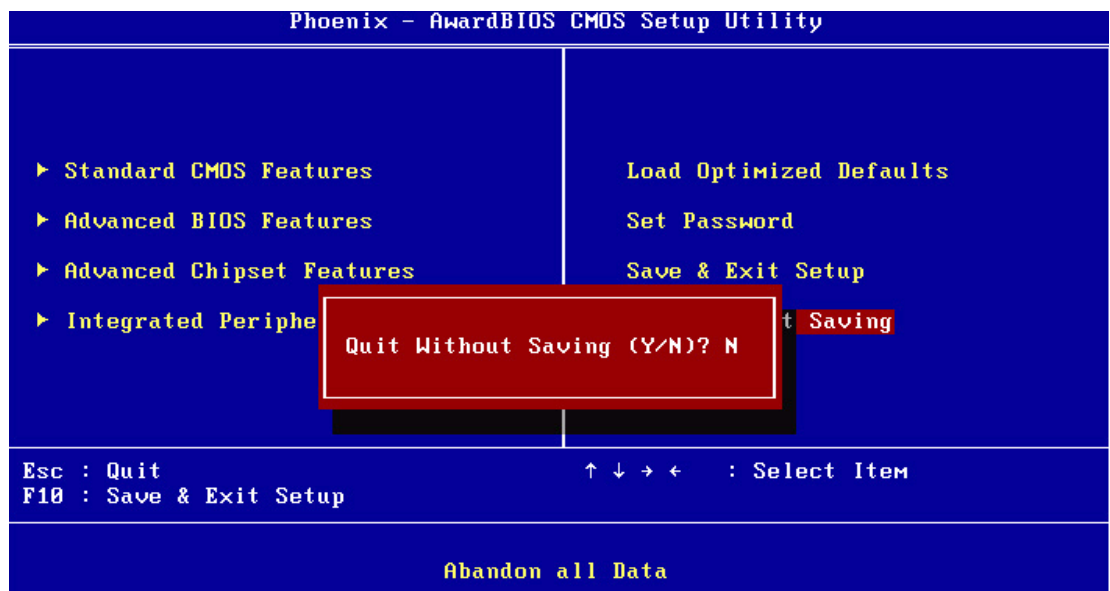


**Note!** Type "Y" will quit the BIOS Setup Utility and save user setup value to CMOS.



Type "N" will return to BIOS Setup Utility.

### 3.2.9 Quit Without Saving



**Note!** Type "Y" will quit the BIOS Setup Utility without saving to CMOS.



Type "N" will return to BIOS Setup Utility.

# Appendix **A**

## System Assignments

This appendix gives you the information about the watchdog timer programming on the SOM-4430 SOC System on Module.

Sections include:

- Watchdog Timer Programming

## A.1 Watchdog Timer Programming

**Table A.1: Watchdog Control: Watchdog Timer Control Register - Index 68h**

Bit	Name	P/W	PWR	Description
7	Reserved	RO	+V 3.3	Reserved
6	WE	R/W	+V 3.3	WDT1 Enable Control (Write bit6=1 to reload WDT1 counter) 0: Disable WDT1 (default) 1: Enable WDT1
5-0	Reserved	RO	+V 3.3	Reserved

**Table A.2: Watchdog Control: Watchdog Timer Control Register - Index 69h**

Bit	Name	P/W	PWR	Description
7-4	SSEL	R/W	+V 3.3	Signal Select after WDT1 timeout B[7-4] Signal 0000 Reserved (default) 0001 IRQ3 0010 IRQ4 0011 IRQ5 0100 IRQ6 0101 IRQ7 0110 IRQ9 0111 IRQ10 1000 IRQ11 1001 IRQ12 1010 IRQ14 1011 IRQ15 1100 NMI 1101 System Reset 1110 Reserved 1111 Reserved
4-0	Reserved	RO	+V3.3	Reserved

**Table A.3: Watchdog Control: Watchdog Timer Control Register - Index 6Ah**

Bit	Name	P/W	PWR	Description
7-0	CNT0	R/W	+ V3.3	WDT1 Counter 0 WDT1 Counter [7-0] Resolution is 30.5us

**Table A.4: Watchdog reset timing control: Watchdog Timer Control Register - Index 6Bh**

Bit	Name	P/W	PWR	Description
7-0	CNT1	RW	+V 3.3	WDT1 Counter 1 WDT1 Counter [15-8] Resolution is 30.5us

# Appendix **B**

## Programming GPIO

This appendix gives the illustration of the General Purpose Input and Output pin setting.

Sections include:

- GPIO Register

## B.1 GPIO Register

**Table B.1: BASE\_ADDR defined on SB PCI CFG 61-60h**

Bit	Name	P/W	PWR	Description
7-0	PORT0DT	RW	+V 5	PORT0 GPIO[7-0] data

**Table B.2: BASE\_ADDR defined on SB PCI CFG 63-62h**

Bit	Name	P/W	PWR	Description
7-0	PORT1DT	RW	+V 5	PORT1 GPIO[15-8] data

**Table B.3: BASE\_ADDR defined on SB PCI CFG 65-64h**

Bit	Name	P/W	PWR	Description
7-0	PORT2DT	RW	+V 5	PORT2 GPIO[23-16] data

**Table B.4: BASE\_ADDR defined on SB PCI CFG 67-66h**

Bit	Name	P/W	PWR	Description
7-0	PORT3DT	RW	+V 5	PORT3 GPIO[31-24] data

**Table B.5: BASE\_ADDR defined on SB PCI CFG 69-68h**

Bit	Name	P/W	PWR	Description
7-0	PORT4 DT	RW	+V 5	PORT4 GPIO[39-32] data

**Table B.6: BASE\_ADDR defined on SB PCI CFG 6B-6Ah**

Bit	Name	P/W	PWR	Description
7-0	PORT0 DT	RW	+V 5	PORT0 GPIO[7-0] Setting 0: Direction is INPUT 1: Direction is OUTPUT
7-0	PORT1 DT	RW	+V 5	PORT1 GPIO[15-8] Setting 0: Direction is INPUT 1: Direction is OUTPUT
7-0	PORT2 DT	RW	+V 5	PORT0 GPIO[23-16] Setting 0: Direction is INPUT 1: Direction is OUTPUT
7-0	PORT3 DT	RW	+V 5	PORT0 GPIO[31-24] Setting 0: Direction is INPUT 1: Direction is OUTPUT
7-0	PORT4 DT	RW	+V 5	PORT0 GPIO[39-32] Setting 0: Direction is INPUT 1: Direction is OUTPUT

# Appendix C

## System Assignments

This appendix gives you the information about the system resource allocation on the SOM-4430 SOC System on Module.

Sections include:

- System I/O ports
- DMA Channel Assignments
- Interrupt Assignments
- 1st MB Memory Map

## C.1 System I/O Ports

**Table C.1: System I/O Ports**

<b>Addr. range</b>	
(Hex)	Device
0CFB-0CF8	PCI Configuration Address Registers
0CFF-0CFC	PCI Configuration Data Registers
00-0F	Slave DMA controller
C0-DE	Master DMA controller
493-499	Instruction Counter
40-43	Timer Counter
48-4B	PWM Controller
22-23	Indirect Access Registers
20-21	Master Interrupt Controller
A0-A1	Slave Interrupt Controller
60,64	Keyboard/Mouse Control Registers
61	NMI Status and Control Register
68-6D	WDT1 Control Registers
70,71	CMOS Memory and RTC Registers
72-75	MTBF Registers
54-57	Serial Port 1
A0-A3	Serial Port 2
A4-A7	Serial Port 3
A8-AB	Serial Port 4
B0-B3	Parallel Port Registers
40-43	SPI Control Registers
60-69	GPIO Registers
10/14	Fast Ethernet MAC Registers
B4-B7	Extend PCI Interrupt Routing Table Registers
F4	8051 and Dual-Port RAM BIST Register

## C.2 DMA Channel Assignments

**Table C.2: DMA Channel Assignments**

<b>Channel</b>	<b>Function</b>
0	Available
1	Available
2	Available
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available



## C.3 Interrupt Assignments

**Table C.3: Interrupt Assignments**

Interrupt#	Interrupt source
NMI	Parity error detected
IRQ 0	Interval timer
IRQ 1	Keyboard
IRQ 2	Available
IRQ 3	Serial communication port 2
IRQ 4	Serial communication port 1
IRQ 5	Serial communication port 5
IRQ 6	Diskette controller (FDC)
IRQ 7	LPT
IRQ 8	Real-time clock
IRQ 9	Microsoft ACPI @C compliant System
IRQ 10	Serial communication port 3
IRQ 11	Serial communication port 4
IRQ 12	PS/2 mouse
IRQ 13	INT from co-processor
IRQ 14	Preliminary IDE
IRQ 15	Network
USB and Ethernet IRQ is automatically set by the system	

## C.4 1st MB Memory Map

**Table C.4: 1st MB Memory Map**

Addr. range (Hex)	Device
F000h - FFFFh	System ROM
E000h - EFFFh	Reserved for BIOS boot
D000h - DFFFh	Available when LAN boot disabled
C000h - CFFFh	VGA BIOS
B800h - BFFFh	CGA/EGA/VGA text
B000h - B7FFh	Reserved for graphic mode usage
A000h - AFFFh	EGA/VGA graphics
0000h - 9FFFh	Base memory

## **[www.advantech.com](http://www.advantech.com)**

Please verify specifications before quoting. This guide is intended for reference purposes only.

All product specifications are subject to change without notice.

No part of this publication may be reproduced in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission of the publisher.

All brand and product names are trademarks or registered trademarks of their respective companies.

© Advantech Co., Ltd. 2008